

CASE REPORT

Reverse Total Shoulder Arthroplasty for Cuff Tear Arthropathy and Glenohumeral Joint Arthritis with Associated Acromioclavicular Joint Ganglion Cyst: A Case Report

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Received: 12 November 2022; Accepted: 22 November 2022; Published: 29 November 2022

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ABSTRACT

Ganglion cyst is a rare manifestation of rotator cuff tear arthropathy. We report a case of 62-year-old female with a massive acromioclavicular joint cyst associated with rotator cuff tear arthropathy. She noted a lump over her right shoulder 3 years ago which has been increasing in size. Her shoulder pain exacerbates with overhead activities and at night. Right arm examination demonstrated significant crepitus, weakness in humerus external rotation and shoulder abduction. Right shoulder x-ray illustrated significant superior humeral head migration and glenohumeral arthritis, and ultrasound showed a large irreparable supraspinatus tear and geysers sign. The ganglion cyst was penetrated and decompressed from glenohumeral joint during a reverse total shoulder replacement with no signs of recurrence noted at 12 weeks follow up. Medical practitioners should be aware reverse total shoulder replacement surgery is an excellent procedure in patients with rotator cuff arthropathy and acromioclavicular joint cyst.

KEYWORDS

Ganglion; Acromioclavicular joint; Cyst; Reverse total shoulder

INTRODUCTION

Ganglion cysts are a mucinous, gelatinous fluid-filled swelling overlying a joint or tendon sheath. They are thought to arise from a herniation of dense connective tissue from tendon sheaths, ligaments, joint capsules, bursae, and menisci [1,2]. Ganglion cysts can occur anywhere in the body but frequently occur over the dorsal side of the wrist and rarely arise over knee, shoulder or spine [1,3].

Acromioclavicular joint (ACJ) cysts are a relatively rare and unusual sequelae of associated shoulder pathology. There have been only 58 reported case reports of ACJ cysts. There are two subtypes that are well described in the literature. Type 1 ACJ cyst occurs due to degenerative process of ACJ and are not associated with rotator cuff tear (Figure 1A) [4]. Type 2 ACJ cyst occurs due to chronic rotator cuff-tear arthropathy or large rotator cuff tear which may cause superior migration of the humeral head secondary to glenohumeral arthritis (Figure 1B) [4]. The synovial fluid and debris from the joint travel up through the coracohumeral rotator interval to the ACJ. Soft tissue swelling directly over the ACJ may represent the ‘geyser sign’ in ultrasonography (Figure 1B) [5]. This sign was first described in 1984 following shoulder arthrogram and in which synovial fluid escapes from the glenohumeral joint and communicates with the ACJ [6].

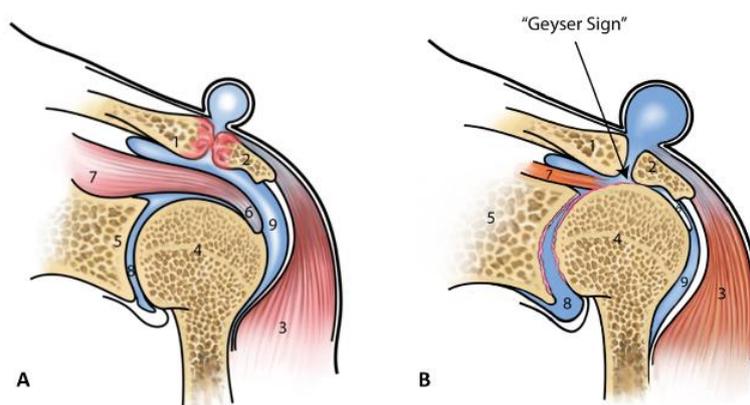


Figure 1: **A)** Schematic diagram showing aetiology of type I cyst. 1) Clavicle; 2) Acromion; 3) Deltoid; 4) Humeral head; 5) Glenoid; 6) Supraspinatus tendon; 7) Supraspinatus muscle; 8) Glenohumeral joint; 9) Subacromial space. **B)** Schematic diagram illustrating aetiology of type II cyst - rotator cuff arthropathy with superior humeral head migration and Glenohumeral joint arthritis. 1) Clavicle; 2) Acromion; 3) Deltoid; 4) Humeral head; 5) Glenoid; 6) Supraspinatus tendon; 7) Supraspinatus muscle; 8) Glenohumeral joint; 9) Subacromial space; 10) Geyser sign.

Open or arthroscopic surgical removal of the cyst along with its stalk has been shown to be quite effective, however, if not properly removed, the ganglion may recur postoperatively [7]. This case report demonstrates that reverse shoulder arthroplasty (RTSA) used as a treatment for rotator cuff arthropathy subsequently resolved concomitant ACJ cyst. The RTSA disrupts the underlying source of material that causes the ACJ cyst.

CASE REPORT

The subject was 62-year-old right hand dominant female who presented with right shoulder pain and a large mass over ACJ for the past 3 years. She complained of three-year history of right shoulder pain exacerbated with overhead activities and presence of prominent lump over her right shoulder. She reported the lump was gradually increasing in size and restricting her range of movement (ROM). The patient has had repeated needle aspirations (3 times) from general practitioner, but the mass recurred. The patient has a 20-years history of rheumatoid arthritis which is well controlled by methotrexate. The examination revealed significant crepitus, weak external rotation, no supraspinatus function (pseudoparalysis) and a large fluctuant mass of size 4 cm × 6 cm × 5 cm over the right ACJ (Figure 2 and Figure 3). The right shoulder had an abnormal functional range of motion with forward flexion (0° - 130°) (Figure 4A) and abduction (0° - 130°) both in active and passive (Figure 4B). There were no clinical or laboratory findings suggestive of an infection.



Figure 2: 4 cm × 5 cm × 6 cm hypoechoic fluid collection above the AC joint, no exuberant fluid was noted by colour Doppler and “Geyser sign” was noted indicative of chronic rotator cuff tear and advanced degenerative changes of the shoulder.



Figure 3: Preoperative clinical photograph of the patient with right shoulder acromioclavicular joint ganglion cyst.



Figure 4: **A)** Restricted forward flexion ROM of right shoulder (0° - 130°). **B)** Restricted shoulder abduction ROM of the right shoulder (0° - 130°).

Right shoulder x-ray showed significant advanced rotator cuff tear arthropathy with superior humeral head migration with acetabularisation of the acromion and glenohumeral arthritis (grade IV according to the Hamada classification) (Figure 5) [8]. Ultrasonography showed a large irreparable supraspinatus tear, superior joint-fluid eruption, and Geyser sign (Figure 1B).

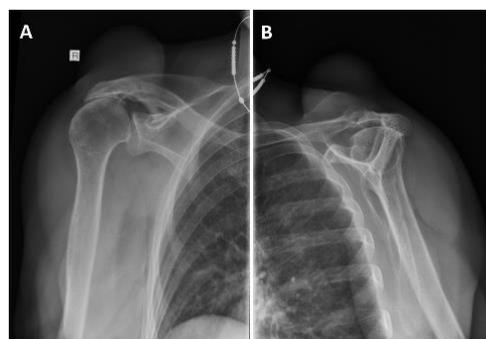


Figure 5: **A)** Anteroposterior X-ray of the right shoulder revealing a grade IV rotator cuff-tear arthropathy with superior migration of the humeral head, acetabularisation, narrowing and arthritis of the glenohumeral joint space and soft tissue mass over ACJ. **B)** Scapula Y X-ray of the right shoulder showing larger soft tissue massive over ACJ and superior migration of the humeral head.

Under general and interscalene brachial plexus nerve block anaesthesia, the patient was placed in a beach chair position. The right shoulder was prepped and draped in a sterile manner. The standard deltopectoral approach was performed following Langer's skin tension lines and the cephalic vein was visualised and mobilised laterally. Tenodesis of the long head of the bicep followed by dislocation and resection of the humeral head. The superior border of the pectoralis major tendon is preserved, protected, and tagged for ease in later identification. The humeral stem is prepared by sequential reaming. Glenoid labrum was excised to expose the pyriform articular surface of the glenoid and any osteophytes and rotator cuff debridement were removed with a rongeur. The glenoid was reamed and k wire was placed along with the central peg and baseplate. Subsequently, the ganglion cyst and its connection to the ACJ were punctured from below by Mayo scissors, decompressed, and suctioned with preservation of coracoacromial ligament with accurate debridement of cyst and the subcutaneous layer was closed (Figure 6).



Figure 6: Reverse total shoulder arthroplasty and ACJ cyst excision.

DISCUSSION

This case demonstrated the type 2 ACJ cyst due to rotator cuff arthropathy. In the presented case, the synovial fluid from the glenohumeral joint escaped into ACJ, with the deteriorated capsule having one-way valve effect led to ACJ cyst formation. During the surgery, the ACJ cyst was penetrated and drained during RTSA and demonstrated no recurrence at 12 weeks follow up. RTSA is an effective procedure in advanced shoulder arthropathy with ACJ cyst and there are no reported cases of ACJ cysts recurrence following RTSA [9,10]. RTSA provides an efficient fulcrum and decreases load through glenoid interface making it more biomechanically stable than other arthroplasty options [11]. The deltopectoral RTSA approach demonstrated in this case allows for appropriate exposure of humeral head for resection and allows for penetration into ACJ cyst allowing for removal of pinch-valve effect created by the rotator cuff arthropathy [11]. Therefore, this case report adds to the growing evidence that RTSA is an excellent treatment choice for ACJ cyst concurrent with rotator cuff arthropathy and longer-term follow up with more case reports will help with confirmation of the effectiveness of this surgical approach.

The treatment of type 2 ACJ cysts can be challenging due to the increased flow of synovial fluid production and flow in presence of degenerated ACJ and associated massive rotator cuff tear. The management options of ACJ cysts in the literature include observation, needle aspiration, capsulorrhaphy, rotator cuff repair/debridement, cyst excisions with/without acromioplasty, hemiarthroplasty, RTSA, and arthrodesis [12]. It is well known that ganglion cysts treated with needle aspiration have a greater than 50% chance of recurrence within one year due to failure to correct the underlying rotator cuff pathology. The trend towards cyst excision and rotator cuff repair is

recommended in the current literature. There is scarce evidence of successful arthroscopic treatment of ACJ cyst with an irreparable rotator cuff due to the inability to excise the pinch valve effect. However, case report of healthy 75-years old male demonstrated that arthroscopic irrigation and debridement with or without additional acromioplasty can be effective as salvage procedure in cases of irreparable rotator cuff defects in patients with low functional demands [13]. Hemiarthroplasty has shown as an acceptable option for rotator cuff arthropathy concomitant with ACJ cyst. However, Skredros et al. demonstrated restricted ROM post-hemiarthroplasty with successful ACJ cyst decompression [14]. Furthermore, with recent successful RTSA case reports, the authors recommend RTSA as a treatment option in patients with severe rotator cuff arthropathy and ACJ cyst [11,15]. Some authors have also reported spontaneous cyst resolution and thus suggest observation as another.

CONCLUSION

ACJ cysts are a rare clinical entity, arising from ACJ degeneration and/or rotator cuff arthropathy. This case report demonstrated that RTSA is a successful treatment option in patients with rotator cuff arthropathy and massive ACJ cyst with no recurrence. RTSA allows for increased shoulder ROM and function while allowing for decompression of ACJ cyst.

CLINICAL IMAGE

Reverse total shoulder arthroplasty has little to no ACJ cyst recurrence postoperatively.

Reverse total shoulder arthroplasty is indicated for patients with advanced symptomatic rotator cuff arthropathy and acromioclavicular cyst formation.

Repetitive needle aspiration as a treatment for type 2 cysts in rotator cuff-tear arthropathy should be avoided due to the high recurrence rate and increased chance of infection.

ACKNOWLEDGEMENT

None.

DECLARATION OF INTEREST

George AC Murrell: Journal of shoulder and elbow surgery: Editorial or governing board, Shoulder and elbow: Editorial or governing board, Smith & Nephew: Paid consultant, Research support. No other interest by other included authors.

ETHICAL APPROVAL

Written informed consent was obtained from the patient for this manuscript and photography.

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